FAQ

DARPA Falcon HTV-2: Frequently Asked Questions

1. How many flights are in the HTV-2 program?
The HTV-2 program has two flights planned. Two flights are required to validate performance characteristics of HTV-2's design including high temperature structures and materials, autonomous precision navigation, guidance, and control (NG&C), aerothermal performance, and an autonomous flight safety system.

2. Do the HTV-2 vehicles have onboard propulsion or are they unpowered?
HTV-2 is an unmanned, rocket-launched maneuverable hypersonic air vehicle (with no on-board propulsion system) that flies through the Earth's atmosphere at incredibly fast speeds – Mach 20 and above.

3. For the first HTV-2 flight (scheduled for April):

a. What role will the Minotaur IV Lite booster fill? To accelerate the HTV-2 to the needed speed and carry it to the needed altitude?
The Minotaur IV Lite rocket will provide the needed acceleration and altitude for the test. The *Minotaur IV Lite* is a 3-stage solid rocket vehicle developed by Orbital Sciences Corporation which utilizes decommissioned Peacekeeper missile stages.

The *Minotaur IV Lite* consists of three main vehicle sections: a government-furnished equipment 3-stage solid-propellant booster, guidance and control assembly, and a payload assembly. More detail is available at http://www.orbital.com/newsinfo/Publications/MinotaurIV_HTV_Fact.pdf

b. To what speed/Mach number will the Minotaur IV Lite booster accelerate the HTV-2?
HTV-2 will reach speeds of Mach 20 and above.

c. To what altitude will the Minotaur IV Lite booster carry the HTV-2?
Jettison of the third stage fairing and HTV-2 vehicle separation occur just outside the atmosphere at an altitude of several hundred thousand feet.

d. After booster/HTV-2 separation, will the HTV-2 maneuver or fly in a straight line?
Following separation, HTV-2 will use autonomous flight control to maneuver during the hypersonic glide portion of the test flight. Three types of maneuvers are planned for the HTV-2 flight test program:

- Energy management maneuvers (the vehicle turns at moderate bank angles to bleed off excess energy)
- Maneuvers to measure aerodynamic control characteristics (short pitch, roll and yaw maneuvers)
- A dive maneuver to impact the ocean within the area defined by range safety as "safe."

e. Will the HTV-2 splash in the ocean, impact land, or land like an airplane?
It will fly over the Pacific Ocean and impact into the broad ocean area (BOA) site north of the U.S. Army Kwajalein Atoll/Reagan Test Site.

f. Will the HTV-2 be recovered after flight?
The HTV-2 will impact/splashdown in the broad ocean near Kwajalein 40 to 80 nautical miles north of Roi-Namur Island. The debris, primarily metal components, is expected to sink and DARPA does not plan to recover or reuse it.

g. How far will the HTV-2 fly? (please tell me if you are using nautical or statute miles)
Total distance from lift-off to impact is approximately 4,100 nautical miles and the Falcon HTV-2 glides for approximately 3,100 nautical miles.

h. Where will the HTV-2 flight end? Near Kwajalein?
The HTV-2 will impact/splashdown in the broad ocean near Kwajalein 40 to 80 nautical miles north of Roi-Namur Island.

i. How long (from liftoff at Vandenberg AFB to HTV-2 splashhown/impact/landing) will the HTV-2 flight last?
The mission will last approximately 30 minutes.

j. What are the objectives of this flight?
DARPA seeks to improve on existing technologies that enable hypersonic flight by developing and testing the HTV-2, an unmanned, rocket-launched maneuverable hypersonic air vehicle that flies through the Earth's atmosphere at incredibly fast speeds – Mach 20 and above.

4. What is the purpose of the HTV-2 program?
The specific goal of the HTV-2 program is to accelerate development of technologies and capabilities that are essential to aircraft flight at hypersonic speeds, culminating in actual flight testing of a revolutionary new hypersonic aircraft – HTV-2.

The key technical challenges and achievements of the HTV-2 program to date are the design of an innovative high lift-to-drag aerodynamic shape, advanced lightweight but tough thermal protection structures, materials and fabrication technologies, autonomous hypersonic navigation guidance and control systems, and an autonomous flight safety system.

For more information, go to www.darpa.mil/tto or contact johanna.jones@darpa.mil